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SITE INSPECTION OF
NIXDORFF-LLOYD CHAIN COMPANY
MARYVILLE, MISSOURI

Prepared for:

U.S. Environmental Protection Agency
Region VII
324 E. Eleventh Street
Kansas City, MO 64108

EPA Contract Number 68-01-6515
Work Assignment R07-005
PN 3597-19

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R00342902
RCRA RECORDS CENTER

August, 1982

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AIR AND HAZARDOUS MATERIALS
DIVISION

GROUND WATER MONITORING COMPLIANCE INSPECTION REPORT

NIXDORFF-LLOYD CHAIN COMPANY, MARYVILLE, MISSOURI

Geology

The facility is located in Nodaway County on moderately dissected plains topography. The underlying bedrock is sedimentary rock of Pennsylvanian age. Overlying the bedrock are deep loess and drift deposits of glacial origin.

Hydrogeology

The hydrogeology of the site is indicated by the logs of the borings and water level measurements completed prior to installation of the monitoring wells. Comparison of borehole water level depths noted on the boring logs indicates that Boring B-1 (also Monitoring Well 1) is apparently the upgradient well. This has not been confirmed, because reference elevations of the tops of the well casings had not yet been established (surveyed) at the time of the inspection. Mr. Hughes said that this would be done shortly. The difference in ground surface elevations among the four (4) monitoring wells appeared to be less than 5 feet. The depth to water in B-1 was reported to be 8.1 feet below ground upon completion of the boring, while the depths to water in B-2, B-3, and B-4 were reported to be 12.0 feet. Therefore, it would appear that B-1 is likely the upgradient well as was intended. On this basis, the direction of ground water flow would appear to be toward the southeast.

All 4 borings were completed to depths of 20.5 feet below ground. Boring B-1 encountered silty clay from ground surface to completion. B-2 and B-3 encountered silty clay from 2 to about 8 feet (topsoil indicated from 0 to 12

feet). From about 8 to 14 feet, B-2 and B-3 encountered sandy clay; below about 14 feet to completion depths B-2 and B-3 encountered clayey sand and/or sand. Boring B-4 encountered silty clay from 1 to 15 feet (fill indicated from 0 to 1 foot). From 15 feet to completion depth, B-4 encountered sandy clay.

Well and water level depths measured during the inspection were as follows:

<u>Well</u>	<u>Well depth (ft below top of casing)</u>	<u>Water level depth (ft below top of casing)</u>
1	22±	5.3±
2	22±	7.2±
3	19±	4.9±
4	21±	5.6±

The measured water levels may not be true static levels, however, because the wells had been bailed by Mr. Hughes on 7/13/82 and the water levels may have still been recovering (rising) at the time of the inspection.

It was noted that two (2) factory supply wells are situated near the northeast and southeast corners of the plant. These wells were recommended to be pumped at the rates of 25 to 35 gallon per minute by Layne-Western Co., the firm who drilled and installed the wells in 1970. Well #1 is 30.5 feet below ground surface and Well #2 is 27.5 feet below ground surface. Both supply wells are within 300 feet of Monitoring Well #3. Based on this limited information, it would appear that pumping of the factory wells may be influencing the ground water flow direction near the surface impoundment.

Ground Water Monitoring Program

Nixdorff-Lloyd Chain has just recently implemented a ground water monitoring program. The monitoring wells were installed on 6/28/82. Water samples had not been collected as of 7/14/82, but the wells were scheduled to be sampled July 15 or 16.

Attachments

- ° Form 1 - General Information and Form 3 - Hazardous Waste Permit Application
- ° Kansas City Testing Lab - Monitoring Well Installation Report
- ° Layne-Western County - Test Drilling and Water Supply Well Report

APPENDIX A-1

**FACILITY INSPECTION FORM FOR COMPLIANCE WITH INTERIM
STATUS STANDARDS COVERING GROUND-WATER MONITORING**

Company Name: Nix dorff-Lloyd Chain ; **EPA I.D. Number:** MOd099238784

Company Address: 2500 E. 1st Street ; **Inspector's Name:** G. Wittman
Maryville, MO PEDCo Environmental

Company Contact/Official: Ed Hughes ; **Branch/Organization:** N-L Chain
St. Louis, MO

Title: Project Engineer ; **Date of Inspection:** 7/14/82

	<u>Yes</u>	<u>No</u>	<u>Unknown</u>	<u>Waived</u>
Type of facility: (check appropriately)				
a) surface impoundment	<u>x</u> (1)	<u> </u>		
b) landfill	<u> </u>	<u>x</u>		
c) land treatment facility	<u> </u>	<u>x</u>		
d) disposal waste pile*	<u> </u>	<u>x</u>		

Ground-Water Monitoring Program

1. Was the ground-water monitoring program reviewed prior to site visit?
If "No",

x

- a) Was the ground-water program reviewed at the facility prior to site inspection?

N/A

2. Has a ground-water monitoring program (capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility) been implemented? 265.90(a)

x

*Listed separate from landfill for convenience of identification.

	<u>Yes</u>	<u>No</u>	<u>Unknown</u>	<u>Waived</u>
3. Has at least one monitoring well been installed in the uppermost aquifer hydraulically upgradient from the limit of the waste management area? 265.91(a)(1)	<u> X </u>	<u> </u>		<u> </u>
a) Are ground-water samples from the uppermost aquifer, representative of background ground-water quality and not affected by the facility (as ensured by proper well number, locations and depths?)	<u> </u>	<u> </u>	X	
4. Have at least three monitoring wells been installed hydraulically downgradient at the limit of the waste handling or management area? 265.91(a)(2)	<u> X </u>	<u> </u>		
a) Do well number, locations and depths ensure prompt detection of any statistically significant amounts of HW or HW constituents that migrate from the waste management area to the uppermost aquifer?	<u> X </u>	<u> </u>		<u> </u>
5. Have the locations of the waste management areas been verified to conform with information in the ground-water program?	<u> X </u>	<u> </u>	<u> </u>	
a) If the facility contains multiple waste management components, is each component adequately monitored?	<u> N/A </u>	<u> </u>		
6. Do the numbers, locations, and depths of the ground-water monitoring wells agree with the data in the ground-water monitoring system program? If "No", explain discrepancies.	<u> X </u>	<u> </u>	<u> </u>	
7. Well completion details. 265.91(c)				
a) Are wells properly cased?	<u> X </u>	<u> </u>	<u> </u>	
b) Are wells screened (perforated) and packed where necessary to enable sampling at appropriate depths?	<u> X </u>	<u> </u>	<u> </u>	
c) Are annular spaces properly sealed to prevent contamination of ground-water?	<u> X </u>	<u> </u>	<u> </u>	

8. Has a ground-water sampling and analysis plan been developed? 265.92(a)

- a) Has it been followed?
b) Is the plan kept at the facility?
c) Does the plan include procedures and techniques for:
1) Sample collection?
2) Sample preservation?
3) Sample shipment?
4) Analytical procedures?
5) Chain of custody control?

Yes No Unknown

x
(to be implemented, 7/82)
x
x
x
x
x

9. Are the required parameters in ground-water samples being tested quarterly for the first year? 265.92(b) and 265.92 (c)(1)

(see 8 (a) above)

a) Are the ground-water samples analyzed for the following:

- 1) Parameters characterizing the suitability of the ground-water as a drinking water supply? 265.92(b)(1)
2) Parameters establishing ground-water quality? 265.92(b)(2)
3) Parameters used as indicators of ground-water contamination? 265.92(b)(3)

?
?
?

(i) For each indicator parameter are at least four replicate measurements obtained at each upgradient well for each sample obtained during the first year of monitoring? 265.92(c)(2)

?

(ii) Are provisions made to calculate the initial background arithmetic mean and variance of the respective parameter concentrations or values obtained from the upgradient well(s) during the first year? 265.92(c)(2)

 x

b) For facilities which have completed first year ground-water sampling and analysis requirements:

N/A

- 1) Have samples been obtained and analyzed for the ground-water quality parameters at least annually? 265.92(d)(1)
2) Have samples been obtained and analyzed for the indicators of ground-water contamination at least semi-annually? 265.92(d)(2)

N/A
N/A

	<u>Yes</u>	<u>No</u>	<u>Unknown</u>
c) Were ground-water surface elevations determined at each monitoring well each time a sample was taken? 265.92(e)	<u>N/A</u>	<u> </u>	
d) Were the ground-water surface elevations evaluated annually to determine whether the monitoring wells are properly placed? 265.93(f)	<u>N/A</u>	<u> </u>	
e) If it was determined that modification of the number, location or depth of monitoring wells was necessary, was the system brought into compliance with 265.91(a)? 265.93(f)	<u>N/A</u>	<u> </u>	
10. Has an outline of a ground-water quality assessment program been prepared? 265.93(a)*	<u>N/A</u>	<u> x </u>	
a) Does it describe a program capable of determining:			
1) Whether hazardous waste or hazardous waste constituents have entered the ground water?	<u>N/A</u>	<u> </u>	
2) The rate and extent of migration of hazardous waste or hazardous waste constituents in ground water?	<u>N/A</u>	<u> </u>	
3) Concentrations of hazardous waste or hazardous waste constituents in ground water?	<u>N/A</u>	<u> </u>	
b) After the first year of monitoring, have at least four replicate measurements of each indicator parameter been obtained for samples taken for each well? 265.93(b)	<u>N/A</u>	<u> </u>	
1) Were the results compared with the initial background means from the upgradient well(s) determined during the first year?	<u>N/A</u>	<u> </u>	
(i) Was each well considered individually?	<u>N/A</u>	<u> </u>	
(ii) Was the Student's t-test used (at the 0.01 level of significance)?	<u>N/A</u>	<u> </u>	
2) Was a significant increase (or pH decrease as well) found in the:			
(i) Upgradient wells	<u>N/A</u>	<u> </u>	
(ii) Downgradient wells	<u>N/A</u>	<u> </u>	
If "Yes", Compliance Checklist A-2 must also be completed.			

	<u>Yes</u>	<u>No</u>	<u>Unknown</u>
11. Have records been kept of analyses for parameters in 265.92(c) and (d)? 265.94(a)(1)	<u>N/A</u>	<u> </u>	
12. Have records been kept of ground-water surface elevations taken at the time of sampling for each well? 265.94(a)(1)	<u>N/A</u>	<u> </u>	
13. Have records been kept of required elevations in 265.93(b)? 265.94(a)(1)	<u>N/A</u>	<u> </u>	
14. Have the following been submitted to the Regional Administrator 265.94(a)(2) :*	<u>N/A</u>		
a) Initial background concentrations of parameters listed in 265.92(b) within 15 days after completing each quarterly analysis required during the first year?	<u>N/A</u>	<u> </u>	
b) For each well, have any parameters whose concentrations or values have exceeded the maximum contaminant levels allowed in drinking water supplies been separately identified?	<u>N/A</u>	<u> </u>	
c) Annual reports including:			
1) Concentrations or values of parameters used as indicators of ground-water contamination for each well along with required evaluations under 265.93(b)?	<u>N/A</u>	<u> </u>	
2) Any significant differences from initial background values in up-gradient wells separately identified?	<u>N/A</u>	<u> </u>	
3) Results of the evaluation of ground-water surface elevations?	<u> </u>	<u> </u>	

NOTE: Groundwater monitoring system installed late June 1982; first samples to be obtained mid-July 1982.

*EPA will be proposing (Spring 1982) to replace this reporting requirement with an exception reporting system where reports will be submitted only where maximum contaminant levels or significant changes in the contamination indicators or other parameters are observed. EPA has delayed compliance stage for 14 a) above until August 1, 1982 (Federal Register, February 23, 1982, p.7841-7842) to be coupled with exception reporting in the interim.

APPENDIX B

GROUND-WATER MONITORING AND ALTERNATE SYSTEM TECHNICAL INFORMATION FORM

1.0 Background Data:

Company Name: Nixdorff-Lloyd Chain; EPA L.D.#: MOD099238784

Company Address: 2500 E. 1st Street
Maryville, MO

Inspector's Name: G. Wittman; Date: 7/14/82

1.1 Type of facility (check appropriately):

- 1.1.1 surface impoundment x (1)
1.1.2 landfill
1.1.3 land treatment facility
1.1.4 disposal waste pile

1.2 Has a ground-water monitoring system been established?

(Y/N) Y

1.2.1 Is a ground-water quality assessment program outlined or proposed?

(Y/N) N

If Yes,

1.2.2 Was it reviewed prior to the site visit?

(Y/N) N/A

1.3 Has a ground-water quality assessment program been implemented or proposed at the site?

(Y/N) N

If yes, Appendix C, Ground-Water Quality Assessment Program Technical Information Form must be utilized also.

2.0 Regional/Facility Map(s)

2.1 Is a regional map of the area, with the facility delineated, included?

(Y/N) Y

If yes,

2.1.1 What is the origin and scale of the map? Map submitted in Part A application, appears to be U.S.G.S. map copy. Scale 1/625000

2.1.2 Is the surficial geology adequately illustrated?

(Y/N) N

2.1.3 Are there any significant topographic or surficial features evident?

(Y/N) N

If yes, describe _____

2.1.4 Are there any streams, rivers, lakes, or wet lands near the facility?

(Y/N) Y

If yes, indicate approximate distances from the facility The Maryville Waterworks and associated surface water (Hundred and Two) is approximately 4,000 feet east of the facility.

2.1.5 Are there any discharging or recharging wells near the facility?

(Y/N) none indicated

If yes, indicate approximate distances from the facility. _____

2.2 Is a regional hydrogeologic map of the area included? (This information may be shown on 2.1)

(Y/N) N

If yes:

2.2.1 Are major areas of recharge/dishcharge shown?

(Y/N) N/A

If yes, describe. _____

2.2.2 Is the regional ground-water flow direction indicated?

(Y/N) N/A

2.2.3 Are the potentiometric contours logical? If not, explain. _____

(Y/N) N/A

2.3 Is a facility plot plan included?

(Y/N) Y

2.3.1 Are facility components (landfill areas, impoundments, etc.) shown?

(Y/N) Y

2.3.2 Are any seeps, springs, streams, ponds, or wetlands indicated?

(Y/N) N

2.3.3 Are the locations of any monitoring wells, soil borings, or test pits shown?

(Y/N) Y

2.3.4 Is the facility a multi-component facility?

(Y/N) N

If yes:

2.3.4.1 Are individual components adequately monitored?

(Y/N) N/A

2.3.4.2 Is a Waste Management Area delineated?

(Y/N) N/A

2.4 Is a site water table (potentiometric) contour map included?

(Y/N) N

If yes,

2.4.1 Do the potentiometric contours appear logical based on topography and presented data? (Consult water level data)

(Y/N) N/A

2.4.2 Are groundwater flowlines indicated?

(Y/N) N/A

2.4.3 Are static water levels shown?

(Y/N) N/A

2.4.4 May hydraulic gradients be estimated?

(Y/N) N/A

2.4.5 Is at least one monitoring well located hydraulically upgradient of the waste management area(s)?

(Y/N) N/A

2.4.6 Are at least three monitoring wells located hydraulically downgradient of the waste management area(s)?

(Y/N) N/A

2.4.7 By their location, do the upgradient wells appear capable of providing representative ambient groundwater quality data?

(Y/N) N/A

If no, explain. _____

3.0 Soil Boring/Test Pit Details

3.1 Were soil borings/test pits made under the supervision of a qualified professional?

(Y/N) Y

If yes,

3.1.1 Indicate the individual(s) and affiliation(s): John V. Zey, P.E.

Kansas City Testing Laboratory, Kansas City, MO 64114

3.1.2 Indicate the drilling/excavating contractor, if known _____

3.2 If soil borings/test pits were made, indicate the method(s) of drilling/excavating:

- Auger (hollow or solid stem) X
- Mud rotary
- Air rotary
- Reverse rotary
- Cable tool
- Jetting
- Other, including excavation (explain)

3.3 List the number of soil borings/test pits made at the site

3.3.1 Pre-existing 3*

3.3.2 For RCRA compliance 4

3.4 Indicate borehole diameters and depths (if different diameters and depths use TABLE B-1).

3.4.1 Diameter: 8 inch

3.4.2 Depth: 20.5 feet

3.5 Were lithologic samples collected during drilling?

(Y/N) Y

If yes,

3.5.1 How were samples obtained? (Check method(s))

- Split spoon X
- Shelby tube, or similar
- Rock coring
- Ditch sampling
- Other (explain)

* 3 test borings for installation of 2 water supply wells were completed in 1970 but are not used to monitor groundwater.

INFORMATION TABLE B-1

BORING NO.	DEPTH	DIAMETER

3.5.2 At what interval were samples collected? not indicated

3.5.3 Were the deposits or rock units penetrated described? (boring logs, etc.) (Y/N) Y

3.6 If test pits were excavated at the site, describe procedures. N/A

4.0 Well Completion Detail

4.1 Were the wells installed under the supervision of a qualified professional? (Y/N) Y

If yes:

4.1.1 Indicate the individual and affiliation, if known John J. Zey, P.E.
Kansas City Testing Laboratory

4.1.2 Indicate the well construction contractor, if known John J. Zey, P.E.
Kansas City Testing Laboratory

4.2 List the number of wells at the site

4.2.1 Pre-existing 2*

4.2.2 For RCRA Compliance 4

4.3 Well construction information (fill out INFORMATION TABLE B-2)

4.3.1 If PVC well screen or casing is used, are joints (couplings):

- Glued on not indicated
- Screwed on

4.3.2 Are well screens sand/gravel packed? (Y/N) Y

* 2 water supply wells were installed in 1970 but are not used to monitor groundwater.

INFORMATION TABLE B-2

WELL NO.		B1	B2	B3	B4		
			NOT SURVEYED				
		20	20	20	20		
WELL CASING	TYPE MATERIAL	PVC	PVC	PVC	PVC		
	DIAMETER	4	4	4	4		
	LENGTH	13	13	13	13		
	STICK-UP	3	2	2	2		
	TOP ELEVATION		NOT SURVEYED				
	BOTTOM ELEVATION	----	----	----	----		
WELL SCREEN	DEPTH TOP/BOTTOM	10 20	10 20	10 20	10 20		
	TYPE MATERIAL	PVC	PVC	PVC	PVC		
	DIAMETER	4	4	4	4		
	LENGTH	10	10	10	10		
	SLOT SIZE		NOT INDICATED				
	TOP ELEVATION	----	----	----	----		
	BOTTOM ELEVATION	----	----	----	----		
OPEN HOLE OR SAND/GRAVEL PACK	DEPTH TOP/BOTTOM	? 20	? 20	? 20	? 20		
	DIAMETER	8	8	8	8		
	LENGTH	10+	10+	10+	10+		
	TOP ELEVATION	----	----	----	----		
	BOTTOM ELEVATION	----	----	----	----		

4.3.3 Are annular spaces sealed?

(Y/N) Y

If yes, describe:

- bentonite slurry
- Cement grout
- Other (explain)

X
bentonite pellets

- Thicknesses of seals not indicated

4.3.4 If "open hole" wells, are the cased portions sealed in place? (Y/N) N/A

If yes, describe how:

4.3.5 Are there cement surface seals?

(Y/N) Y

If yes,

- How thick? not indicated

4.3.6 Are the wells capped?

(Y/N) Y

If yes,

- Do they lock?

(Y/N) Y

4.3.7 Are protective standpipes cemented in place?

(Y/N) Y

4.3.8 Were wells developed?

(Y/N) Y

If yes, check appropriate method(s):

- Air lift pumping
- Pumping and surging
- Jetting
- Bailing
- Other (explain)

X

5.0 Aquifer Characterization

5.1 Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined?

(Y/N) Y

If yes,

5.1.1 Are soil boring/test pit logs included?

(Y/N) Y

5.1.2 Are geologic cross-sections included?

(Y/N) N

5.2 Is there evidence of confining (low permeability) layers beneath the site?

(Y/N) Y

If yes,

5.2.1 Is the areal extent and continuity indicated?

(Y/N) N

5.2.2 Is there any potential for saturated conditions (perched water) to occur above the uppermost aquifer? (Y/N) N

If yes, give details: _____

a) Should or is this perched zone being monitored?

(Y/N) N/A

Explain _____

5.2.3 What is the lithology and texture of the uppermost saturated zone (aquifer)? clayey sand and sandy clay

5.2.4 What is the saturated thickness, if indicated? not indicated

5.3 Were static water levels measured?

(Y/N) Y

If yes,

5.3.1 How were the water levels measured (check method(s)).

- Electric water sounder
- Wetted tape
- Air line
- Other (explain)

X

5.3.2 Do fluctuations in static water levels occur?

(Y/N) not indicated

If yes,

5.3.2.1 Are they accounted for (e.g. seasonal, tidal, etc.)?

(Y/N) N/A

If yes, describe: _____

5.3.2.2 Do the water level fluctuations alter the general ground-water gradients and flow directions?

(Y/N) N/A

If yes,

5.3.2.3 Will the effectiveness of the wells to detect contaminants be reduced?

(Y/N) N/A

Explain _____

5.3.2.4 Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone?

(Y/N) N/A

If yes, explain _____

5.4 Have aquifer hydraulic properties been determined?

(Y/N) N

If yes,

5.4.1 Indicate method(s):

- Pumping tests _____
 - Falling/constant head tests _____
 - Laboratory tests (explain) N/A
- _____

5.4.2 If determined, what are the values for:

- Transmissivity _____
- Storage coefficient _____
- Leakage _____
- Permeability _____
- Porosity _____
- Specific capacity _____

N/A

5.4.3 In cases where several tests were undertaken, were discrepancies in the results evident?

(Y/N) N/A

If yes, explain _____

5.4.4 Were horizontal ground-water flow velocities determined?

(Y/N) N/A

If yes, indicate rate of movement _____

6.0 Well Performance

6.1 Are the monitoring wells screened in the uppermost aquifer? (Y/N) Y

6.1.1 Is the full saturated thickness screened? (Y/N) N

6.1.2 For single completions, are the intake areas in the:
(check appropriate levels)

- Upper portion of the aquifer
- Middle of the aquifer
- Lower portion of the aquifer

X

6.1.3 For well clusters, are the intake areas open to different portions of the aquifer? (Y/N) N/A

6.1.4 Do the intake levels of the monitoring wells appear to be justified due to possible contaminant density and groundwater flow velocity? (Y/N) Y

7.0 Ground-Water Quality Sampling

7.1 Is a sampling (groundwater quality) program and schedule included? (Y/N) Y

7.2 Are sample collection field procedures clearly outlined? (Y/N) N

7.2.1 How are samples obtained: (check method(s))

- Air lift pump
- Submersible pump
- Positive displacement pump
- Centrifugal pump
- Peristaltic or other suction-lift pump
- Bailer
- Other (describe)

X

7.2.2 Are all wells sampled with the same equipment and procedures? (Y/N) Y

If no, explain

7.2.3 Are adequate provisions included to clean equipment after sampling to prevent cross-contamination between wells? (Y/N) N

7.2.4 Are organic constituents to be sampled?

(Y/N) Y

If yes,

7.2.4.1 Are samples collected with equipment to minimize absorption and volatilization?

(Y/N) N

If yes,

Describe equipment _____

8.0 Sample Preservation and Handling first samples to be collected mid-July 1982

8.1 Have appropriate sample preservation and preparation procedures been followed (filtration and preservation where appropriate)?

(Y/N) N/A

8.2 Are samples refrigerated?

(Y/N) N/A

8.3 Are EPA recommended sample holding period requirements adhered to?

(Y/N) N/A

8.4 Are suitable container types used?

(Y/N) N/A

8.5 Are provisions made to store and ship samples under cold conditions (ice packs, etc.)?

(Y/N) Y

8.6 Is a chain of custody control procedure clearly defined?

(Y/N) Y

8.7 Is a specific chain of custody form illustrated?

(Y/N) N

If yes,

8.7.1 Will this form provide an accurate record of sample possession from the moment the sample is taken until the time it is analyzed?

(Y/N) N/A

9.0 Sample Analysis and Record Keeping

9.1 Is sample analysis performed by a qualified laboratory?

(Y/N) Y

Indicate lab Kansas City Testing Lab

9.2 Are analytical methods described in the records?

(Y/N) Y

9.2.1 Are analytical methods acceptable to EPA?

(Y/N) Y

9.3 Are the required drinking water suitability parameters tested for?

(Y/N) Y*

9.4 Are the required groundwater quality parameters tested for?

(Y/N) Y

* except fluoride, nitrate, and pesticides

9.5 Are the required groundwater contamination indicator parameters tested for? (Y/N) Y

9.6 Are any analytical parameters determined in the field? (Y/N) N

Identify:

- pH _____
- Temperature _____
- Specific conductance _____
- Other (describe) _____

9.7 Is a plan included to record information about each sample collected during the groundwater monitoring program? (Y/N) N

9.7.1 Are field activity logs included? (Y/N) N/A

9.7.2 Are laboratory results included? (Y/N) N/A

9.7.3 Are field procedures recorded? (Y/N) N/A

9.7.4 Are field parameter determinations included? (Y/N) N/A

9.7.5 Are the names and affiliation of the field personnel included? (Y/N) N/A

9.8 Are statistical analyses planned or shown for all water quality results where necessary? (Y/N) N

9.8.1 Is an analysis program set-up which adheres to EPA guidelines? (Y/N) N

9.8.2 Is Student's t-test utilized? (Y/N) N
If other evaluation procedure used, identify _____

9.8.3 Are provisions made for submitting analysis reports to the Regional Administrator? (Y/N) N

10.0 Site Verification

10.1 Plot Plan indicating the locations of various facility components, ground-water monitoring wells, and surface waters? (Y/N) Y

10.1.1 Is the plot plan used for the inspection the same as in the monitoring program plan documentation? (Y/N) Y

If not, explain _____

10.1.2 Are all of the components of the facility identified during the inspection addressed in the monitoring program documentation? (Y/N) Y

If not, explain _____

10.1.3 Are there any streams, lakes or wetlands on or adjacent to the site? (Y/N) N

If yes, indicate distances from waste management areas _____

10.1.4 Are there any signs of water quality degradation evident in the surface water bodies? (Y/N) N/A

If yes, explain _____

10.1.5 Is there any indication of distressed or dead vegetation on or adjacent to the site? (Y/N) N

If yes, explain _____

10.1.6 Are there any significant topographic or surficial features on or near the site (e.g., recharge or discharge areas)? (Y/N) N

If yes, explain _____

10.1.7 Are the monitor well locations and numbers in agreement with the monitoring program documentation? (Y/N) Y

If no, explain _____

10.1.7.1 Were locations and elevations of the monitor wells surveyed into some known datum? (Y/N) N

If not, explain wells were to be surveyed within one or two weeks

10.1.7.2 Were the wells sounded to determine total depth below the surface? (Y/N) Y

If not, explain _____

10.1.7.3 Were discrepancies in total depth greater than two feet apparent in any well? (Y/N) N

If yes, explain _____

10.1.8 Was ground water encountered in all monitoring wells? (Y/N) Y

If not, indicate which well(s) were dry _____

10.1.9 Were water level elevations measured during the site visit? (Y/N) N*

If yes, indicate well number and water level elevation _____

If not, explain * water level depths were measured; elevations had not been surveyed

<u>Well No.</u>	<u>Water level depth below top casing (ft)</u>
1	5.3
2	7.2
3	4.9
4	5.6

FORM 1
GENERAL
EPA
ENVIRONMENTAL PROTECTION AGENCY
GENERAL INFORMATION
Consolidated Permits Program
(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER
F M O D Ø

LABEL ITEMS
I. EPA I.D. NUMBER
III. FACILITY NAME
V. FACILITY MAILING ADDRESS
VI. FACILITY LOCATION

MONROE299503
2500 E 1ST ST
MARYVILLE, MO 64468
2500 E 1ST ST
MARYVILLE, MO 64468

GENERAL INSTRUCTIONS
If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X'			SPECIFIC QUESTIONS	MARK 'X'		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X		B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X		D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X		H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X		J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY
1 SKIP NIXDORFF-LLOYD CHAIN CO.

IV. FACILITY CONTACT
A. NAME & TITLE (last, first, & title)
2 SOMMERHAUSER CHARLES MECH DESR
B. PHONE (area code & no.)
314 421 2676

V. FACILITY MAILING ADDRESS
A. STREET OR P.O. BOX
3
B. CITY OR TOWN
4
C. STATE
D. ZIP CODE

VI. FACILITY LOCATION
A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER
5
B. COUNTY NAME
NODAWAY COUNTY
C. CITY OR TOWN
6
D. STATE
E. ZIP CODE
F. COUNTY CODE (if known)

NOV 19 1980

II. SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
3	4	9	6	(specify)	7	3	5
Production of Welded Chain				(specify)	Pickling of Steel Rod		
C. THIRD				D. FOURTH			
3	4	7	1	(specify)	7		
Zinc Electroplating				(specify)	N/A		

III. OPERATOR INFORMATION

A. NAME										B. Is the name listed in Item VIII-A also the owner?	
NIXDORFF METAL PRODUCTS, INC.										<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)										D. PHONE (area code & no.)	
F = FEDERAL		M = PUBLIC (other than federal or state)		P (specify)		N/A		3		4	
S = STATE		O = OTHER (specify)						A		3	
R = PRIVATE								1		4	
E. STREET OR P.O. BOX										1	
O BOX 14828										2	
F. CITY OR TOWN										G. STATE	
ST. LOUIS,										MO	
H. ZIP CODE										IX. INDIAN LAND	
63178										Is the facility located on Indian lands?	
										<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)				D. PSD (Air Emissions from Proposed Sources)			
N			N/A	9	P		N/A
B. UIC (Underground Injection of Fluids)				E. OTHER (specify)			
U			N/A	9			1499
C. RCRA (Hazardous Wastes)				E. OTHER (specify)			
R			N/A	9			N/A

I. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

II. NATURE OF BUSINESS (provide a brief description)

This plant produces bulk chain from pickled & drawn wire. The end product is hardware chain, automobile and truck tire chain. The product can be shipped as manufactured, or may be zinc electroplated.

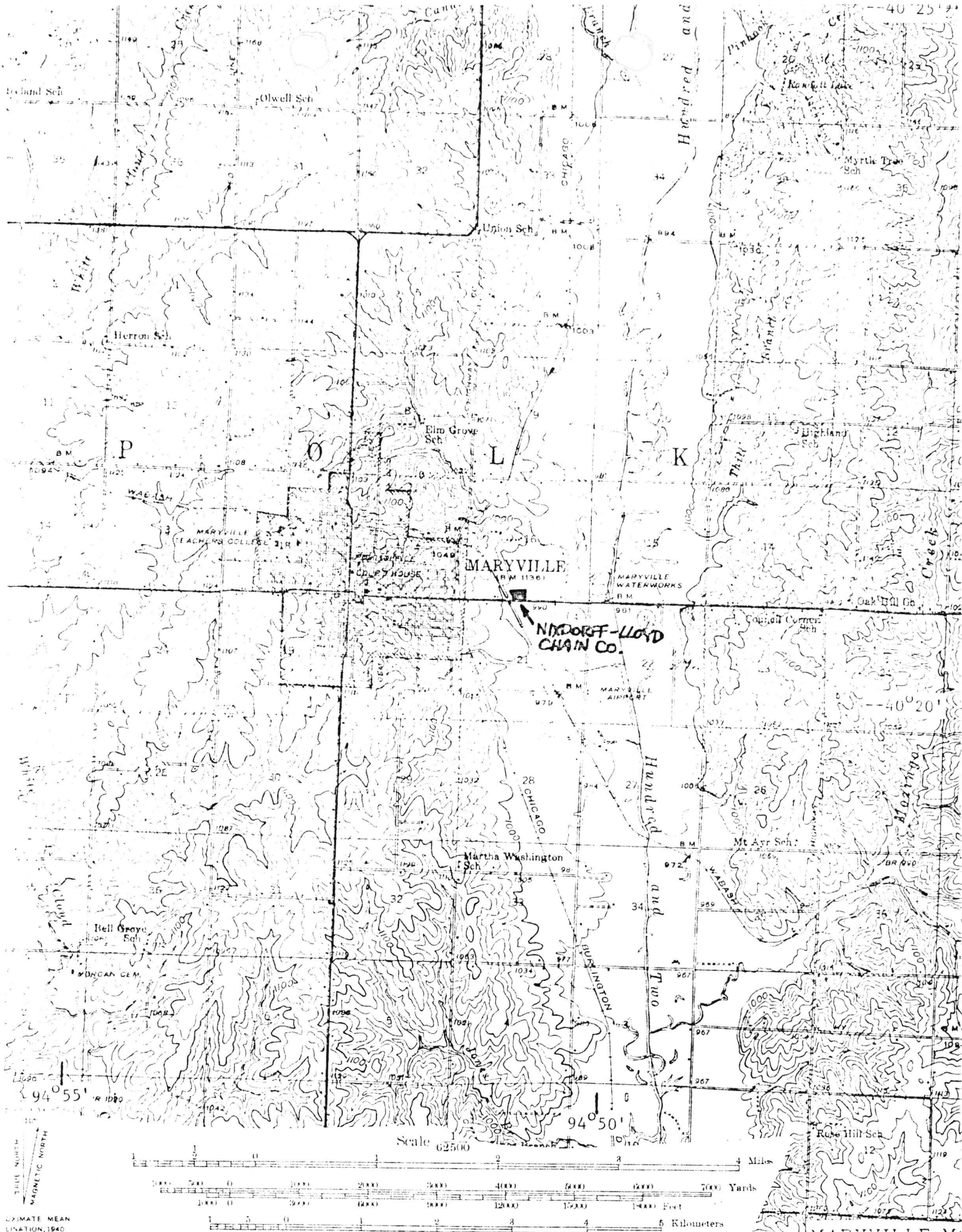
III. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Robert N. Schulte, President		11/18/80

COMMENTS FOR OFFICIAL USE ONLY

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ESTIMATE MEAN
CLINATION, 1940

Contour interval 20 feet
Datum is mean sea level

MARYVILLE, MO
Edition of 1943
N4015-W9445/15

FORM 3510-3 RCRA

 ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION
Consolidated Permits Program
(This information is required under Section 3001 of RCRA)

I. EPA I.D. NUMBER
F M O D 0 0 0 2 9 9 9 0 9

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

☒ 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)

☐ 2. NEW FACILITY (Complete item below.)

YR. MO. DAY
7 1 10 26

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left)

YR. MO. DAY

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

B. REVISED APPLICATION (place an "X" below and complete Item I above)

☐ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES - CODES AND DESIGN CAPACITIES

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the form (Item III-C).

B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.

1. AMOUNT - Enter the amount.
2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY	PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:			Treatment:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS	TANK	T01	GALLONS PER DAY OR LITERS PER DAY
TANK	S02	GALLONS OR LITERS	SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS	INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS	OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY
Disposal:					
INJECTION WELL	D79	GALLONS OR LITERS			
LANDFILL	D80	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER			
LAND APPLICATION	D81	ACRES OR HECTARES			
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY			
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS			
UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

DUP

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY	FOR OFFICIAL USE ONLY
		1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)			1. AMOUNT	2. UNIT OF MEASURE (enter code)
X-1	S 0 2	600	G	5			
X-2	T 0 3	20	E	6			
1	S 0 4	683000	G	7			
2				8			
3				9			
4				10			

II. PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR DESCRIBING OTHER PROCESSES (code)

FOR EACH PROCESS ENTERED HERE

FOR EACH PROCESS ENTERED HERE

V. DESCRIPTION OF HAZARDOUS WASTES

EPA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE CODE
POUNDS P
TONS T

METRIC UNIT OF MEASURE CODE
KILOGRAMS K
METRIC TONS M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

1. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

- Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
- In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
- Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARDOUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES							
				1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (if a code is not entered in D(1))			
X-1	K 0 5 4	900	P	T	0	3	D	8	0		
X-2	D 0 0 2	400	P	T	0	3	D	8	0		
X-3	D 0 0 1	100	P	T	0	3	D	8	0		
X-4	D 0 0 2									included with above	

EPA I.D. NUMBER (enter from page 1)												FOR OFFICIAL USE ONLY											
<div style="display: flex; justify-content: space-between;"> W M O D 0 0 0 2 9 9 9 0 9 1 </div>												<div style="display: flex; justify-content: space-between;"> W DUP 2 DUP </div>											

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES										
				1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (if a code is not entered in D(1))						
1	K 0 6 2	1,300,000	P	S	0	4								
2	F 0 0 8	500	P	S	0	4								
3	F 0 0 9	13,250	P	S	0	4								
4														
5														
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24														
25														
26														

(continued)

USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE

FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

VI. PHOTOGRAPHS

All existing facilities must include photographs (*aerial or ground-level*) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (*see instructions for more detail*).

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)										LONGITUDE (degrees, minutes, & seconds)									
4	0	2	0	4	5	0	0	9	4	5	0	5	0	0					
10	00	00	00	00	00	00	00	00	00	00	00	00	00						

III. FACILITY OWNER


- ☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER														2. PHONE NO. (area code & no.)																	
Inland Realty Co.														3 1 4 - 8 7 2 - 8 5 0 0																	
3. STREET OR P.O. BOX														4. CITY OR TOWN										5. ST.		6. ZIP CODE					
727 Craig Rd, P.O.Box 27479														G St. Louis										MO		6 3 1 4 1					


IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

<p>A. NAME (print or type)</p> <p>Millard S. Cohen, Vice President</p>	<p>B. SIGNATURE</p> 	<p>C. DATE SIGNED</p> <p>November 18, 1980</p>
--	--	--

X. OPERATOR CERTIFICATION

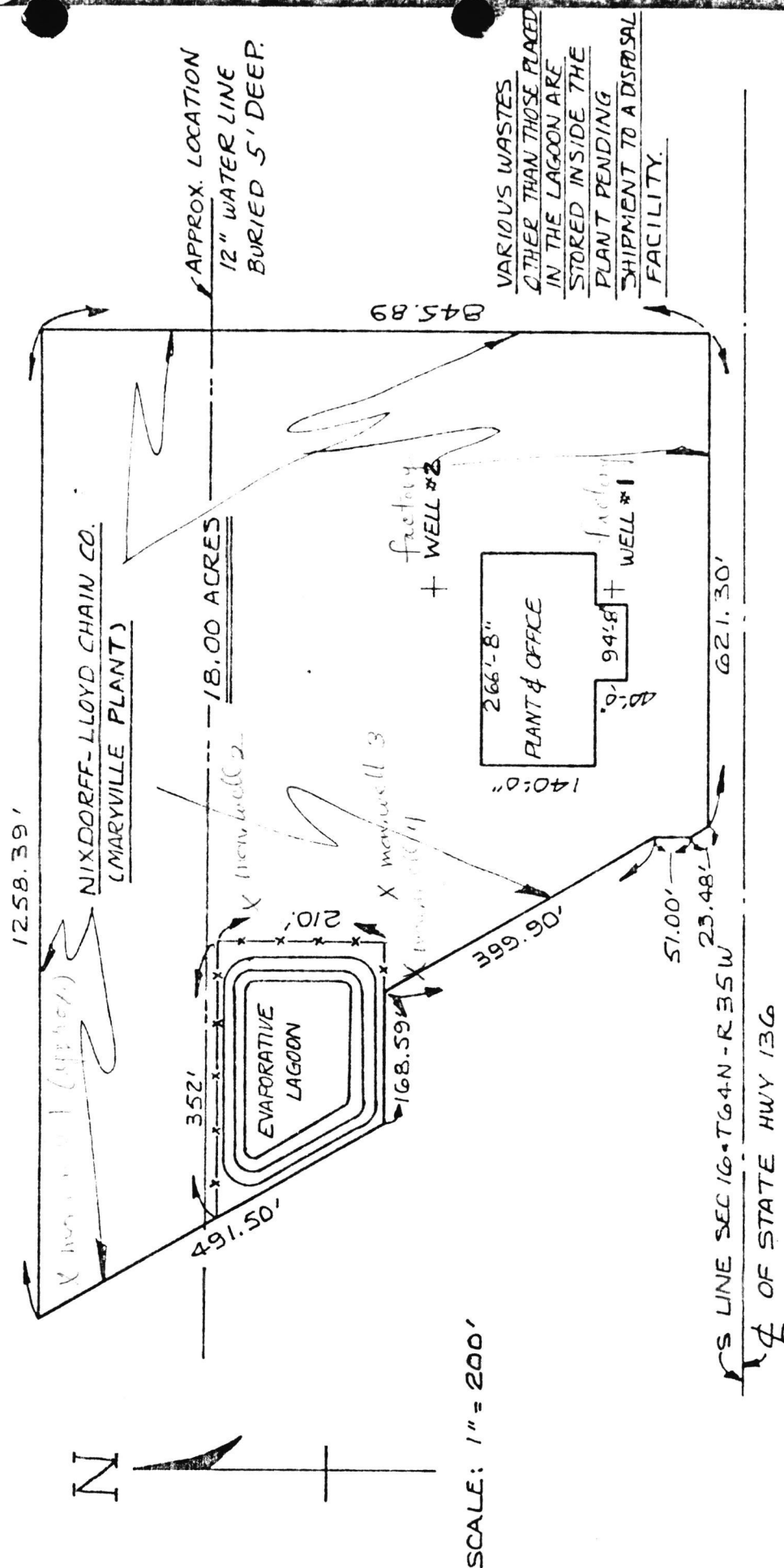
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

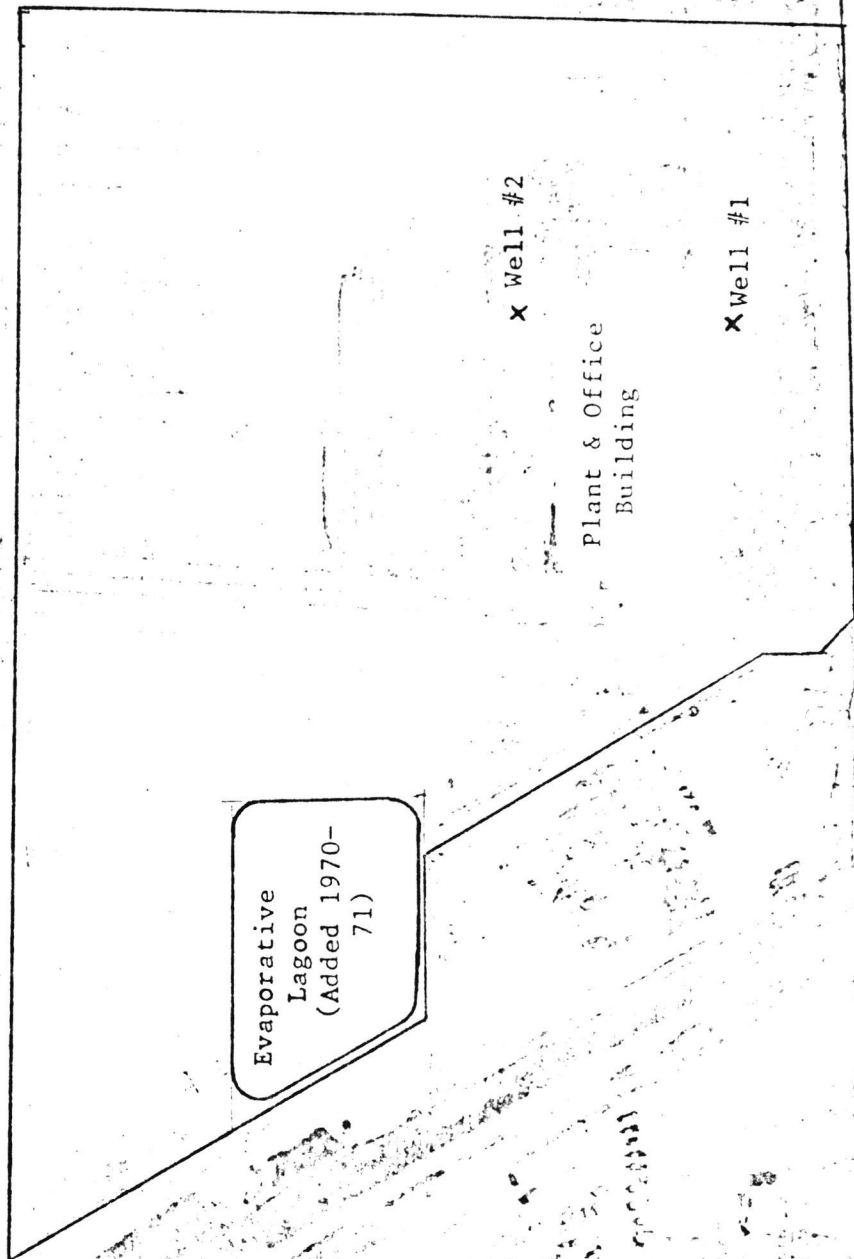
A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
Robert N. Schulte, President		November 18, 1980

V. FACILITY DRAWING (see page 4)

NOTE:

A PORTION OF THE 18 ACRES WHICH IS NOT REQUIRED FOR MANUFACTURING PURPOSES IS SUBLEASED FOR CROP FARMING.





NIXDORFF-LLOYD CHAIN CO.

Maryville, MO Plant

Source: City of Maryville

Roger Bird, City Engineer

1970 Photo



From the office of

KANSAS CITY TESTING LABORATORY

1669 JEFFERSON

A.C. 913—648-2303

P. O. Box 8586

KANSAS CITY, MISSOURI 64114

July 1, 1982

Nixdorff-Lloyd Chain Company
916 Howard Street
P. O. Box 14828
St. Louis, Missouri 63178

Attention: Mr. Edmund G. Hughes

Reference: Monitoring Well Installation
Maryville Missouri Facility

Dear Sir:

We have completed the installation of four groundwater monitoring wells at the approximate locations shown on the attached sketch. Also shown on the sketch is a typical as-built detail of the monitoring wells we installed. Boring logs were prepared by the geotechnical engineer for each well which describe the subsurface materials encountered. Copies of these boring logs are attached to this report. All wells were installed under the direct supervision of the geotechnical engineer.

Should you have any questions, please contact our office at your convenience.

Respectfully submitted,
KANSAS CITY TESTING LABORATORY

John J. Zey
John J. Zey, P. E.
Geotechnical Engineer

JJZ/mjt



KAN CITY TESTING LABORATORY

FOUNDATION TESTS FOR:

TEST BORING LOG

Nixdorff-Lloyd Chain Co.

Building Site: Monitoring Well Installation

Location: Maryville, MO

Date: 6-28-82

Boring No.: B1 Location: see sketch

Scale: 1 inch = 3 feet

Log	Elevation	Depth in Feet	Description	No. of Blows	Depth Inches
		0.0	DARK BROWN SILTY CLAY (CL)		
		1.5	LIGHT BROWN SILTY CLAY MOIST, STIFF (CL)		
		8.1	SAME MATERIAL		
		12.0	TAN SILTY CLAY VERY STIFF, SOME SAND (CL)		
			FREE WATER ENCOUNTERED AT 13.0'		
		20.5	TERMINATION OF BORING WATER LEVEL AT 8.1' UPON COMPLETION OF BORING		



KAN CITY TESTING LABORATORY

FOUNDATION TESTS FOR:

Nixdorff-Lloyd Chain Co.

TEST BORING LOG

Building Site: Monitoring Wall Installation



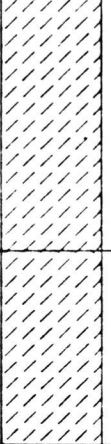

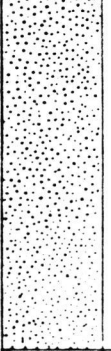
Location: Maryville, MO

Date: 6-28-82

Boring No.: B2

Location: see sketch

Scale: 1 inch = 3 feet

Log	Elevation	Depth in Feet	Description	No. of Blows	Depth Inches
		0.0	TOPSOIL DARK GRAY CLAYEY SILT MOIST, LOOSE		
		2.0	BROWN SILTY CLAY MOIST, STIFF (CL)		
		8.0	LIGHT BROWN SANDY CLAY MOIST, MEDIUM, STIFF (CL)		
	▽	12.0	GRAY SANDY CLAY MOIST, STIFF (CL) FREE WATER ENCOUNTERED AT 12.5'		
		15.0	BROWN CLAYEY SAND WET, MEDIUM, STIFF (SC)		
		20.5	TERMINATION OF BORING WATER LEVEL AT 12.0' UPON COMPLETION OF BORING		



KANSAS CITY TESTING LABORATORY

FOUNDATION TESTS FOR:

Nixdorff-Lloyd Chain Co.

TEST BORING LOG

Building Site: Monitoring Wall Installation

Location: Maryville, MO

Date: 6-28-82

Boring No.: B3

Location: see sketch

Scale: 1 inch = 3 feet

Log	Elevation	Depth in Feet	Description	No. of Blows	Depth Inches
		0.0	TOPSOIL DARK GRAY CLAYEY SILT MOIST, LOOSE		
		2.0	BROWN SILTY CLAY MOIST, MEDIUM STIFF TO STIFF (CL)		
		8.5	GRAY SILTY SANDY CLAY MOIST, STIFF (CL)		
	▽	12.0	SAME MATERIAL		
		13.0	BROWN CLAYEY SAND WET, MEDIUM STIFF (SC) FREE WATER ENCOUNTERED AT 13.0'		
		18.0	BROWN FINE TO MEDIUM SAND WET, LOOSE (SP)		
		20.5	TERMINATION OF BORING WATER LEVEL AT 12.0' UPON COMPLETION OF BORING		



KANSAS CITY TESTING LABORATORY

FOUNDATION TESTS FOR:
Nixdorff-Lloyd Chain Co.

TEST BORING LOG

Building Site: Monitoring Well Installation

Location: Maryville, MO

Date: 6-28-82

Boring No.: B4

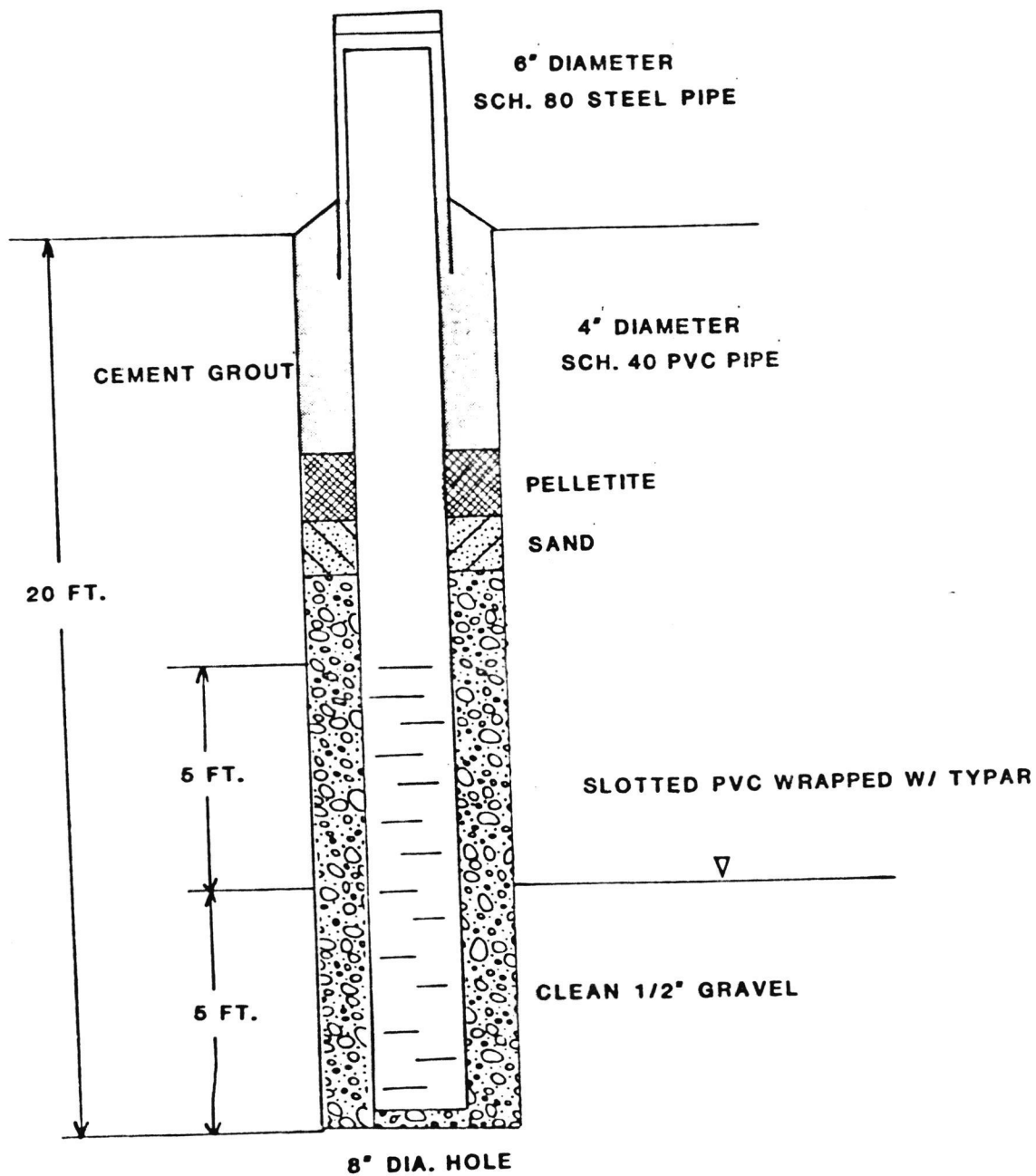
Location: see sketch

Scale: 1 inch = 3 feet

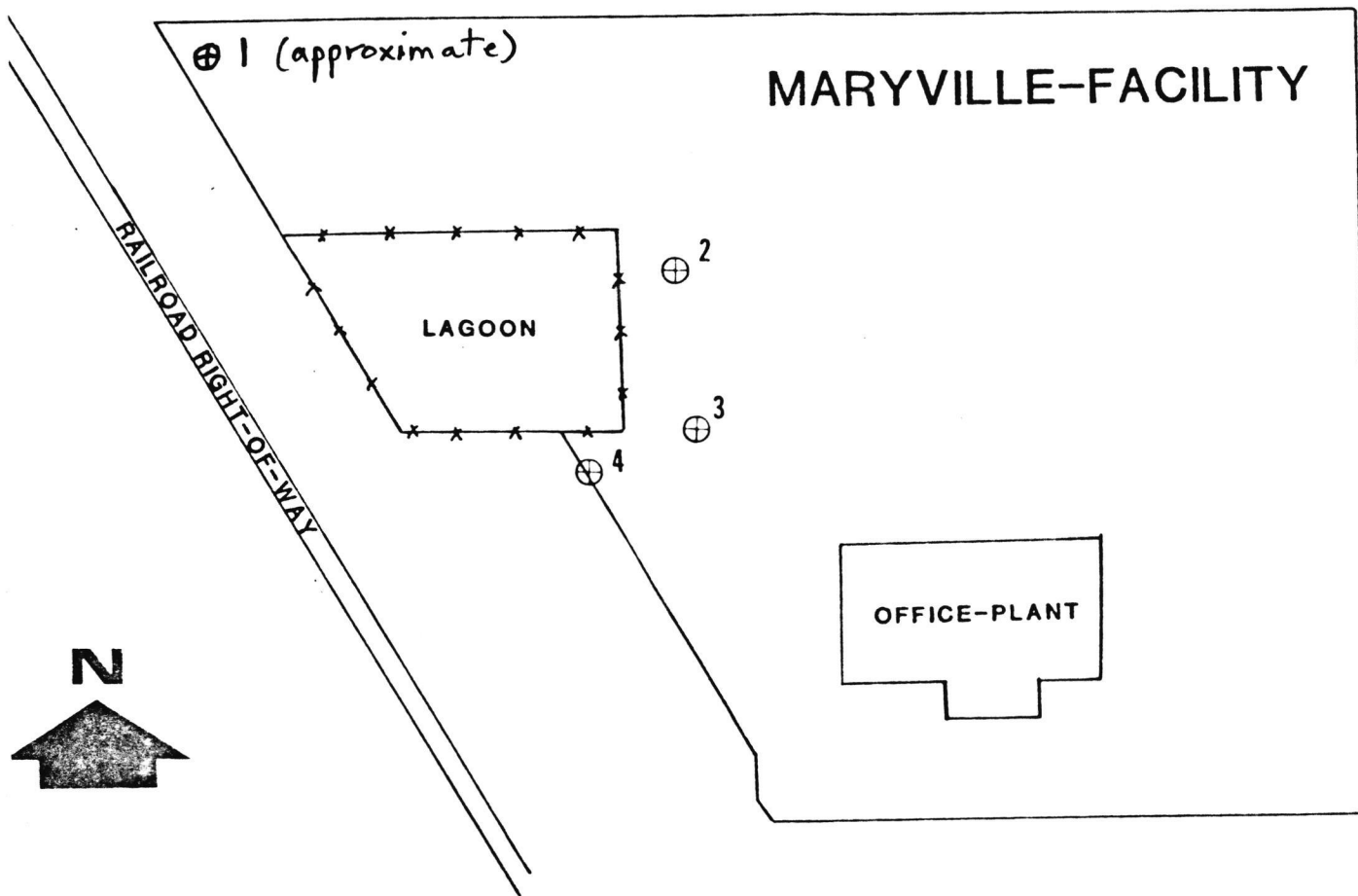
Log	Elevation	Depth in Feet	Description	No. of Blows	Depth Inches
		0.0	FILL DARK BROWN SILTY CLAY WITH GRAVEL		
		1.0	GRAY SILTY CLAY MOIST, STIFF (CL)		
		8.0	LIGHT BROWN SILTY CLAY WITH TRACE OF SAND MOIST, MEDIUM, STIFF (CL)		
	▽	12.0	SAME MATERIAL		
		15.0	DARK GRAY SANDY CLAY MOIST, VERY STIFF (CL) FREE WATER ENCOUNTERED AT 15.0'		
		20.5	TERMINATION OF BORING WATER LEVEL AT 12.0' UPON COMPLETION OF BORING		

1 ⊕

MISSOURI HIGHWAY
DEPT. PROPERTY



TYPICAL AS-BUILT DETAIL



KANSAS CITY TESTING LABORATORY Engineering Consultants		
MONITORING WELL LOCATIONS		
NIXDORFF LLOYD CHAIN CO.		DRAWING NUMBER
SCALE: 1" - 200'	APPROVED BY:	DRAWN BY JZ
DATE: 6-29-82		REVISED



Layne-Western Company, Inc.

WATER SUPPLY SERVICES

WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
1010 West 39th Street • Kansas City, Missouri 64111 • AC 816 931-2353

April 22, 1970

Lloyd Chain Corporation
Highway 136
Maryville, Missouri

Attention Mr. Norman Craig

Gentlemen:

TEST DRILLING AND WATER SUPPLY WELLS

We have completed the drilling of three (3) test borings and the installation of two (2) water supply wells at your facility on Highway 136 at the east edge of Maryville, Missouri.

Enclosed herewith are copies of our well information sheet giving details of construction of each well and our boring logs for the three (3) test holes drilled.

In addition, we are enclosing our invoice for the completed work.

In an attempt to find a deeper, more reliable aquifer (usually just above bedrock), the first two (2) test borings were drilled to the top of the bedrock surface. No suitable aquifer material was penetrated below a depth of approximately 30' so the third test boring was not drilled to the bedrock surface.

The most suitable aquifer was found in Test Borings No. 1 and 3, at a depth of approximately 20 to 30'. Since this was the only aquifer available, and the best material available, it was decided to install shallow wells at Test Borings No. 1 and 3. The south well, or Well No. 1, was installed at Test Boring No. 1-70. The north well, or Well No. 2, was installed at Test Boring No. 3-70. Well No. 1 was installed to a total depth from ground surface of 30'6" and Well No. 2 a total depth of 27'6" from ground level.

Norman Craig
Page -2-
April 22, 1970

A short pumping test was run on both of the completed wells and the results of the pumping test are as shown on the enclosed information sheets.

We would recommend that the pumping rate from Well No. 1 your south well, be limited to 35 gpm. The pump installed in this well, should be set 1' from the bottom of the well or 29'6" from ground level.

Well No. 2, your north well, should not be pumped at a rate greater than 25 gpm. The pump installed in this well, again should be set 1' from the bottom of the well, or 26'6" from ground level.

The above information was given to your plumber, Mr. Bill Jones, by telephone, so that he would know the pumping rates and depths the pumps should be set.

Of course, all our information is based upon the pumping tests we performed and is subject to seasonal variation. During periods of extremely wet weather when the aquifer is receiving good recharge, we would expect the wells could possibly be pumped at greater capacities than recommended, for short periods of time. On the other hand, during extreme drought conditions, the flow from the well may have to be restricted somewhat from the rates we recommend.

We appreciate your confidence in Layne-Western Company in allowing us to do this recent water supply work for you and sincerely hope our workmanship and materials have in every way met with your satisfaction. Should you have any questions regarding any of the information enclosed, or the invoicing of our work, please get in touch with us.

If we may be of further service, please let us know.

Thank you very much.

Very truly yours,


James J. Bridgforth, P.E.



TEST HOLE REPORT

Layne-Western Company

Contract Name Lloyd Chain Corporation

Job No. KC 633-B

Date 4/7/70

City Maryville

State Missouri

Driller J. Harper

TEST HOLE

No. 2-70

Test Hole Location 7.5" S.W. of s.w. corner of building

Distance and Direction from Permanent Landmark or Previous Test Hole

TEST LOG

FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	Static Water Level _____ Measured _____ Hours After Completion
				FORMATION
0'0"	1'0"			Clay fill
1'0"	5'0"			Dark gray clay, stiff
5'0"	10'0"			Light gray clay, stiff
10'0"	19'0"			Gray silty clay, med.
19'0"	21'0"	water)		Gray fine to med. sand
21'0"	25'0"	")	2"	Gray med. to fine, some coarse sand
25'0"	26'0"	"		Gray med. to coarse, tr. ^{TRACE} fine sand, gravel
26'0"	61'0"			Gray sandy clay, med.
61'0"	86'0"			Gray sandy clay, stiff
86'0"	90'0"			Gray <u>limy shale</u> , hard
90'0"	Total depth			

NOTES: Size of Pit 4'0" X 3'0" X 4'0"

DEEP



TEST HOLE REPORT

Layne-Western Company

Contract Name Lloyd Chain Corporation

Job No. KC 633-B

Date 3/7/70

City Maryville

State Missouri

Driller J. Harper

TEST HOLE factory

No. 3/70 well #2

Test Hole Location 225'0" N. of No. 1-70

Distance and Direction from Permanent Landmark or Previous Test Hole

TEST LOG

FROM	TO	MARSH FUNNEL VISCOSITY SECONDS	MUD PIT LOSS INCHES	Static Water Level _____ Measured _____ Hours After Completion
				FORMATION
0'0"	1'0"			Top soil
1'0"	4'0"			Dark gray clay, stiff
4'0"	10'0"			Gray clay, stiff
10'0"	12'0"			Brown & gray silty clay, stiff
12'0"	15'0"			Brown clayey silt, soft
15'0"	19'0"			Gray sandy clay, stiff
19'0"	25'0"	water	6"	Gray med. to coarse, some fine sand
25'0"	27'6"	water	8"	Same tr. fine sand, tr. gravel
27'0"	33'0"			Gray sandy clay, med.

NOTES: Size of Pit 4'0" X 3'0" X 3'6"

DEEP